Final

Site Investigation Report
Former Fog Oil Storage Area
West of the Skeet Range, Parcel 122(7)

Fort McClellan
Calhoun County, Alabama

Prepared for:

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Task Order CK05
Contract No. DACA21-96-D-0018
IT Project No. 774645

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Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Task Order CK05, IT Corporation completed a site investigation (SI) at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), at Fort McClellan in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site, and, if present, whether the concentrations present an unacceptable risk to human health or the environment. The SI at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), consisted of the sampling and analysis of 63 surface soil screening samples, 4 subsurface soil samples, 1 surface water sample, and 1 sediment sample. Four direct-push soil borings installed at the site provided site-specific geological characterization information.

The surface soils screening for hydrocarbons at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), indicated that total petroleum hydrocarbons-diesel range organics (TPH-DRO) were present in surface soils. TPH-DRO concentrations ranged from less than 11 mg/kg to 100 mg/kg. However, the TPH-DRO data were collected for screening purposes only; therefore, instrument calibration requirements for the method were waived. Consequently, the quantitative results of this screening level TPH-DRO analysis should be considered estimated.

Chemical analysis of the four subsurface soil samples (including two subsurface soil samples that were relocated to the locations with the highest surface soil screening results), one surface water sample, and one sediment sample was limited to SVOCs only. SVOCs were not detected in any of the subsurface soil, surface water, or sediment samples collected at the site. In the future land-use scenario, portions of Parcel 122(7) will be reused for retail, passive recreation, and for the Eastern Bypass. Under these land-use scenarios, the concentrations of TPH-DRO in surface soils are not expected to pose a significant threat to human health or ecological receptors.

Based on the results of the SI, past operations at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), do not appear to have adversely impacted the environment. The low levels of TPH-DRO detected in surface soils at the site do not pose an unacceptable risk to human health and the environment. Therefore, IT recommends “No Further Action” and unrestricted land reuse with regard to hazardous, toxic, and radioactive waste at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7).

1.0 Introduction

The U.S. Army has selected Fort McClellan (FTMC) located in Calhoun County, Alabama, for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The 1990 Base Closure Act, Public Law 101-510, established the process by which U.S. Department of Defense (DOD) installations would be closed or realigned. The BRAC Environmental Restoration Program requires investigation and cleanup of federal properties prior to transfer to the public domain. The U.S. Army is conducting environmental studies of the impact of suspected contaminants at parcels at FTMC under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE contracted with IT Corporation (IT) to perform the site investigation (SI) at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), under Contract Number DACA21-96-D-0018, Task Order CK05.

This SI report presents specific information and results compiled from the SI, including field sampling and analysis, conducted at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7).

1.1 Project Description

The Former Fog Oil Storage Area West of the Skeet Range was identified as an area to be investigated prior to property transfer. The site was classified as a Category 7 site in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Category 7 sites are areas that are not evaluated and/or that require further evaluation.

A site-specific field sampling plan (SFSP) attachment (IT, 1998a) and a site-specific safety and health plan (SSHP) attachment were finalized in December 1998. The SFSP and SSHP were prepared to provide technical guidance for sample collection and analysis at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7). The SFSP was used in conjunction with the SSHP as attachments to the installation-wide work plan (IT, 1998b) and the installation-wide sampling and analysis plan (SAP) (IT, 2000a). The SAP includes the installation-wide safety and health plan (SHP) and quality assurance plan (QAP).

The SI included fieldwork to collect 63 surface soil screening samples, 4 subsurface soil samples, 1 surface water sample, and 1 sediment sample. Data from the field investigation were used to determine whether potential site-specific chemicals are present at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7).

1.2 Purpose and Objectives

The SI program was designed to collect data from site media and provide a level of defensible data and information in sufficient detail to determine whether chemical constituents are present at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), at concentrations that present an unacceptable risk to human health or the environment. Based on the conclusions presented in this SI report, the BRAC Cleanup Team will decide either to propose "No Further Action" at the site or to conduct additional work at the site.

1.3 Site Description and History

The Former Fog Oil Storage Area West of the Skeet Range is located just west of Iron Mountain Road on the Main Post near the skeet range (Figure 1-1). The dates of use for the site could not be determined. The parcel, which covers approximately 3.5 acres, is bounded by mostly wooded or undeveloped areas (Figure 1-2). The overgrown remains of a dirt road traverse the site from northeast to southwest. This road and the cleared area (Parcel 122[7]) are visible only in the 1949 photograph composite of the Environmental Photographic Interpretation Center report (U.S. Environmental Protection Agency [EPA], 1990). The entire site is now covered with trees and brush. Near the center of the site, concrete blocks, metal stays, and brackets were found by IT personnel during the June 1998 site walk. These items may be the remains of fog oil drum racks.

Fog oil was used by the military to produce an obscurant for concealing troops, beach landings, and supplies during World War II and the Korean War. Fog oil smoke can be produced from mobile personnel carriers (mobile smoke) or from stationary locations (static smoke). The petroleum distillate the military labels "fog oil" is also used as diesel engine lubricating oil. Industrial uses of the oil are in metal-working oils, cutting oils, newspaper ink, agricultural pesticides, livestock spray, and medicinal uses such as laxatives (3D International Environmental Group [3D], 1996).

Fog oil is the middle distillate product of crude petroleum oil. There is not an exact formulation for fog oil, and it can be described as a mineral oil, petroleum distillate, or hydrotreated heavy napthenic base oil (3D, 1996). The military has used standard grade fuels (SGF 1 and SGF 2), diesel fuel, jet fuel petroleum grade 4, and kerosene to produce smoke (3D, 1996). SGF 2 is similar to Society of Automotive Engineers No. 20 motor oil (Brubaker, et al., 1992). SGF 2 has not been used since 1956; SGF 1 has not been supplied to the military since the 1970s (3D, 1996). SGF 2 has been modified to reduce aromatic hydrocarbons. An analysis of SGF 2

E 664,300

E 665,300

N

PARCEL 122(7)

N 1,166,100

N 1,165,500

CONCRETE BLOCKS
METAL BRACKETS

850

825

800

3139

3149

FLOW DIRECTION

JEEP ROAD
(OVERGROWN)

WOODS

TRIBUTARY OF REMOUNT CREEK
FLOW DIRECTION

IRON MOUNTAIN ROAD

REMOUNT CREEK

SKEET RANGE/TRAP

POND

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- FENCE
- UTILITY POLE
- DAM

SCALE
0 100 200 FEET

FIGURE 1-2
SITE MAP
FORMER FOG OIL STORAGE AREA
WEST OF SKEET RANGE
PARCEL 122(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

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DRAWN BY:
STARTING DATE: 09/21/00
DRAWN BY: D. BILLINGSLEY
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performed in August 1995 indicated the presence of aliphatic, alkane, and alkene hydrocarbons (3D, 1996); aromatic hydrocarbons were not detected in the sample. Early fog oils contained approximately 50 percent aliphatic compounds and 50 percent aromatic compounds.

The Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), falls within the "Possible Explosive Ordnance Impact Area" shown on Plate 10 of the FTMC Archive Search Report, Maps (USACE, 1998).

Parcel 122(7) slopes to the southeast and ranges in elevation from approximately 805 to 835 feet above mean sea level. Surface runoff follows topography and flows south-southeast toward a tributary to Remount Creek, which runs west to east through the southern portion of the site.

2.0 Previous Investigations

An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with DOD guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)

2. Areas where only release or disposal of petroleum products has occurred

3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response

4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken

5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken

6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented

7. Areas that are not evaluated or require additional evaluation.

The EBS was conducted in accordance with Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, the Alabama Department of Environmental Management (ADEM), EPA Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historical maps and aerial photographs were reviewed to document historical land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were

conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

The Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), was classified as a Category 7 CERFA site. The site lacked adequate documentation and, therefore, required additional evaluation to determine the environmental condition of the parcel.

3.0 Current Site Investigation Activities

This chapter summarizes SI activities conducted by IT at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), including unexploded ordnance (UXO) avoidance activities, hydrocarbon screening, and environmental sampling and analysis.

3.1 UXO Avoidance

UXO avoidance was performed at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), following methodology outlined in Section 4.1.7 of the SAP (IT, 2000a). IT UXO personnel used a Schonstedt Heliflux Magnetic Locator to perform a surface sweep of the parcel prior to site access. After the parcel was cleared for access, sample locations were cleared using a Foerster Ferex Electromagnetic Detector following procedures outlined in Section 4.1.7.3 of the SAP (IT, 2000a).

3.2 Hydrocarbon Screening

Surface soil screening samples for hydrocarbon analysis were collected from 63 locations at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7). The surface soil screening sample locations and rationale are presented in Table 3-1. The sampling locations were placed at 50-foot intervals in a grid covering the approximately 2-acre parcel, as shown on Figure 3-1. The surface soil screening samples were analyzed for total petroleum hydrocarbons-diesel range organics (TPH-DRO) according to the methodology presented in Screening Methodology in this section.

Sample Collection. Surface soil screening samples were collected from the upper 0.5 foot of soil with direct-push technology using the methodology specified in Section 4.9.1.1 of the SAP (IT, 2000a). Surface soil screening samples were collected by first removing surface debris, such as rocks and vegetation, from the immediate sample area. The soil was collected with the sampling device and screened with a photoionization detector (PID) in accordance with Section 4.7.1.1 of the SAP (IT, 2000a). The sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. Sample collection logs are included in Appendix A.

Screening Methodology. Surface soil analyses for hydrocarbon compounds were performed by Quanterra Environmental Services in Knoxville, Tennessee using a screening-level version of EPA Method 8015B for TPH-DRO. This analytical method was selected because fog oil is a middle distillate product of crude petroleum oil and consists of various mixtures of medium to

Table 3-1

Sampling Locations and Rationale
Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7)
Fort McClellan, Calhoun County, Alabama

Sample Designation	Media Sampled	Sample Location Rationale
Surface Soil Screening, Locations PPMP-122-SS01 through SS63	Surface Soil	Surface soil screening samples for heavy hydrocarbons analysis were collected at 63 locations within the parcel. The screening locations were evenly spaced on 50-foot centers in a grid covering approximately 2 acres.
PPMP-122-GP01	Subsurface Soil	A subsurface soil sample was collected at the highest elevation within the parcel. This sampling location is in the northwest corner of the parcel and is upgradient of any potential contaminants on the site.
PPMP-122-GP02	Subsurface Soil	A subsurface soil sample was collected at a surface soil screening location (PPMP-122-SS11) that had elevated TPH-DRO concentrations.
PPMP-122-GP03	Subsurface Soil	A subsurface soil sample was collected at a surface soil screening location (PPMP-122-SS30) that had elevated TPH-DRO concentrations.
PPMP-122-GP04	Subsurface Soil	A subsurface soil sample was collected from a low elevation within the parcel, where runoff could collect before infiltrating to the subsurface soil or migrating to off site surface water bodies.
PPMP-122-SW/SD01	Surface Water Sediment	Surface water and sediment samples were collected from an intermittent tributary to Remount Creek that runs through the southern portion of the parcel.

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N 1,166,100

N 1,165,500

PARCEL 122(7)

PPMP-122-GP01

PPMP-122-GP02

PPMP-122-GP03

PPMP-122-GP04

PPMP-122-SW/SD01

SS01 SS02 SS03 SS04 SS05 SS06 SS07 SS08 SS09 SS10 SS11 SS12 SS13 SS14 SS15 SS16 SS17 SS18 SS19 SS20 SS21 SS22 SS23 SS24 SS25 SS26 SS27 SS28 SS29 SS30 SS31 SS32 SS33 SS34 SS35 SS36 SS37 SS38 SS39 SS40 SS41 SS42 SS43 SS44 SS45 SS46 SS47 SS48 SS49 SS50 SS51 SS52 SS53 SS54 SS55 SS56 SS57 SS58 SS59 SS60 SS61 SS62 SS63

CONCRETE BLOCKS
METAL BRACKETS

FLOW DIRECTION

JEEP ROAD (OVERGROWN)

TRIBUTARY OF REMOUNT CREEK

IRON MOUNTAIN ROAD

REMOUNT CREEK

WOODS

POND

SKEET RANGE/TRAP

850 825 800

3139 3149

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- DAM
- FENCE
- UTILITY POLE
- SURFACE WATER/SEDIMENT SAMPLE LOCATION
- TPH-DRO FIELD SCREENING SURFACE SOIL SAMPLE LOCATION
- SUBSURFACE SOIL SAMPLE LOCATION

SCALE
0 100 200 FEET

NOTE:

1. TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE ORGANIC (TPH-DRO) FIELD SCREENING SURFACE SOIL SAMPLES WITH DESIGNATION SSXX HAVE A PREFIX OF PPMP-122-.

FIGURE 3-1
SAMPLE LOCATION MAP
FORMER FOG OIL STORAGE AREA
WEST OF SKEET RANGE
PARCEL 122(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

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heavy molecular weight hydrocarbon compounds found in fuels and motor oil from which fog oil is derived (IT, 1998a). Instrument calibration requirements for the screening-level analysis were waived to facilitate the analysis. As such, the quantitative results of this screening level TPH-DRO analysis should be considered estimated. This approach was selected over the on-site gas chromatography analysis described in the SFSP (IT,1998a) because it was more cost effective for the small number of samples collected.

Based on the TPH-DRO surface soil screening results, two of the four proposed subsurface soil borings (PPMP-122-GP02 and PPMP-122-GP03) were relocated to areas where the surface soil screening data indicated elevated concentrations of TPH-DRO. Section 5.1 presents the surface soil screening results. Appendix A contains the sample collection logs, and Appendix B contains the analytical reports for the surface soil screening samples.

3.3 Environmental Sampling

The environmental sampling performed during the SI at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), included the collection of subsurface soil samples and surface water and sediment samples for chemical analysis. The sample locations were determined by observing site physical characteristics during a site walkover, by reviewing historical documents pertaining to activities conducted at the site, and based on the surface soil hydrocarbon screening results. The sample locations, media, and rationale are summarized in Table 3-1. Sampling locations are shown on Figure 3-1. Samples were submitted for laboratory analysis of site-related parameters listed in Section 3.5.

3.3.1 Subsurface Soil Sampling

Subsurface soil samples were collected from four soil borings at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), as shown on Figure 3-1. Subsurface soil sampling locations and rationale are presented in Table 3-1. Subsurface soil sample designations, depths, and quality assurance/quality control (QA/QC) samples are listed in Table 3-2. Soil boring sampling locations were determined in the field by the on-site geologist based on the sampling rationale, the results of surface soil screening, the presence of surface structures, and site topography. IT contracted TEG, Inc., a direct-push technology subcontractor, to assist in subsurface soil sample collection.

Table 3-2

Subsurface Soil Sample Designations and QA/QC Samples
Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
PPMP-122-GP01	PPMP-122-GP01-DS-KY0001-REG	6-8				TCL SVOCs
PPMP-122-GP02	PPMP-122-GP02-DS-KY0002-REG	2-5				TCL SVOCs
PPMP-122-GP03	PPMP-122-GP03-DS-KY0003-REG	6-8				TCL SVOCs
PPMP-122-GP04	PPMP-122-GP04-DS-KY0004-REG	3-6	PPMP-122-GP04-DS-KY0005-FD	PPMP-122-GP04-DS-KY0006-FS	PPMP-122-GP04-DS-KY0004-MS PPMP-122-GP04-DS-KY0004-MSD	TCL SVOCs

FD - Field duplicate.
FS - Field split.
ft. bgs - feet below ground surface.
MS/MSD - Matrix spike/matrix spike duplicate.
QA/QC - Quality assurance/quality control.
SVOC - Semivolatile organic compound.
TCL - Target compound list.

Sample Collection. Subsurface soil samples were collected from soil borings at depths greater than 1 foot below ground surface (bgs) in the unsaturated zone. The soil borings were advanced and samples collected using the direct-push sampling procedures specified in Section 4.9.1.1 of the SAP (IT, 2000a). Sample collection logs are included in Appendix A. The samples were analyzed for semivolatile organic compounds (SVOC) using EPA Method 8270C.

Subsurface soil samples were collected continuously until direct-push sampler refusal was encountered. Samples were field screened using a PID in accordance with Section 4.7.1.1 of the SAP (IT, 2000a) to measure for volatile organic vapors. The sample displaying the highest reading was selected and sent to the laboratory for analysis; however, at those locations where PID readings were not greater than background, the deepest sample interval above the saturated zone was submitted for analysis. The sample was transferred from the sampler to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. Samples submitted for laboratory analysis are summarized in Table 3-2. The on-site geologist constructed a detailed boring log for each soil boring. The boring log for each borehole is included in Appendix C.

3.3.2 Surface Water Sampling

One surface water sample was collected from the tributary to Remount Creek in the southern portion of Parcel 122(7), as shown on Figure 3-1. The surface water sampling location and rationale are listed in Table 3-1. The surface water sample designation and QA/QC samples are listed in Table 3-3.

Sample Collection. The surface water sample was collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 2000a). The sample was collected by dipping a stainless-steel pitcher in the water and pouring the water into the appropriate sample container. The sample was collected after the field parameters had been measured using a calibrated water quality meter. The field parameter readings are presented in Table 3-4. The sample collection log is included in Appendix A. The sample was analyzed for SVOCs using EPA Method 8270C.

3.3.3 Sediment Sampling

One sediment sample was collected at the same location as the surface water sample, as shown on Figure 3-1. The sediment sampling location and rationale are listed in Table 3-1. The sediment sample designation is listed in Table 3-3.

Table 3-3

Surface Water and Sediment Sample Designations and QA/QC Samples
Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
PPMP-122-SW/SD01	PPMP-122-SW/SD01-SW-KY2001-REG PPMP-122-SW/SD01-SD-KY1001-REG	NA 0-0.5	PPMP-122-SW/SD01-SW-KY2002-FD	PPMP-122-SW/SD01-SW- KY2003-FS		TCL SVOCs, TOC, Grain size (sediment only)

FD - Field duplicate.
FS - Field split.
ft. bgs - feet below ground surface.
MS/MSD - Matrix spike/matrix spike duplicate.
NA - Not applicable.
QA/QC - Quality assurance/quality control.
SVOC - Semivolatile organic compound.
TCL - Target compound list.
TOC - Total organic carbon.

Table 3-4

Surface Water Field Parameters
Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Date	Specific Conductivity (mS/cm)[a]	Dissolved Oxygen (mg/L)	ORP (mV)	Temperature (°C)	Turbidity (NTU)	pH (SU)
PPMP-122-SW/SD01	8-Feb-99	0.243	5.8	229.1	11.76	5.7	5.29

[a] Specific conductivity values standardized to millisiemens per centimeter.

°C - Degrees Celsius.
mg/L - Milligrams per liter.
mS/cm - millisiemens per centimeter.
mV - Millivolts.
NTU - Nephelometric turbidity unit.
ORP - Oxidation-reduction potential.
SU - Standard unit.

Sample Collection. The sediment sample was collected in accordance with the procedures outlined in Section 4.9.1.2 of the SAP (IT, 2000a). The sample was collected from the upper 0.5 foot of sediment with a stainless-steel hand auger. The sediment was transferred to a stainless-steel bowl, homogenized, and placed in the appropriate sample containers. The sample collection log is included in Appendix A. The sample was analyzed for the parameters listed in Table 3-3 using methods outlined in Section 3.5.

3.4 Surveying of Sample Locations

Sample locations were surveyed using global positioning system survey techniques described in Section 4.3 of the SAP (IT, 2000a) and conventional civil survey techniques described in Section 4.19 of the SAP (IT, 2000a). Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Appendix D.

3.5 Analytical Program

The subsurface soil, surface water, and sediment samples collected during the SI were analyzed for target compound list SVOCs (EPA Method 8270C). In addition, the sediment sample was analyzed for total organic carbon (EPA Method 9060) and grain size (American Society for Testing and Materials Method D421/D422). The specific suite of analyses performed was based on the potential site-specific chemicals historically at the site and EPA, ADEM, FTMC, and USACE requirements.

The samples were analyzed using EPA SW-846 methods, including Update III methods where applicable, as presented in Table 6-1 in Appendix B of the SAP (IT, 2000a). Data were reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of Appendix B of the SAP [IT, 2000a]). Chemical data were reported via hard-copy data packages by the laboratory using Contract Laboratory Program-like forms. These packages were validated in accordance with EPA National Functional Guidelines by Level III criteria. A summary of validated data is included in Appendix E. The Data Validation Summary Report is included as Appendix F.

3.6 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping followed requirements specified in Section 4.13.2 of the SAP (IT, 2000a). Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SI are listed in Chapter 5.0, Table 5-1, of Appendix B of the SAP

(IT, 2000a). Sample documentation and chain-of-custody records were recorded as specified in Section 4.13 of the SAP (IT, 2000a).

Completed analysis request and chain of custody records (Appendix A) were secured and included with each shipment of sample coolers to Quanterra Environmental Services in Knoxville, Tennessee. Split samples were shipped to USACE South Atlantic Division Laboratory in Marietta, Georgia.

3.7 Investigation-Derived Waste Management and Disposal

Investigation-derived waste (IDW) was managed and disposed as outlined in Appendix D of the SAP (IT, 2000a). The IDW generated during the SI at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), was segregated as follows:

- Soil boring cuttings
- Decontamination fluids
- Personal protective equipment.

Solid IDW was stored inside the fenced area surrounding Buildings 335 and 336 in lined roll-off bins prior to characterization and final disposal. Solid IDW was characterized using toxicity characteristic leaching procedure analysis. Based on the results, soil boring cuttings and personal protective equipment generated during the SI at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), were disposed as nonregulated waste at the Industrial Waste Landfill on the Main Post of FTMC.

Liquid IDW was contained in the existing 20,000-gallon sump associated with the Building T-338 vehicle washrack. Liquid IDW was characterized by volatile organic compound, SVOC, and metals analyses. Based on the analyses, liquid IDW was discharged as nonregulated waste to the FTMC wastewater treatment plant on the Main Post.

3.8 Variances/Nonconformances

One variance to the SFSP was recorded during completion of the SI at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7). The variance did not alter the intent of the investigation or the sampling rationale presented in Table 4-2 of the SFSP (IT, 1998a). The variance to the SFSP is summarized in Table 3-5 and included in Appendix G.

There were not any nonconformances to the SFSP recorded during completion of the SI at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7).

Table 3-5

Variance to the Site-Specific Field Sampling Plan
Former Fog Oil Storage Area, Parcel 122(7)
Fort McClellan, Calhoun County, Alabama

Variance to the SFSP	Justification for Variance	Impact to Site Investigation
PPMP-122-GP02 and PPMP-122-GP03 were relocated from their proposed locations. PPMP-122-GP02 was moved approximately 50 feet southwest, and PPMP-122-GP03 was moved approximately 150 feet east.	The two subsurface soil samples were relocated to areas within the parcel that contained elevated concentrations of total petroleum hydrocarbons-diesel range organics in the soil.	Relocating the two subsurface soil samples allowed more accurate determination of the subsurface soil contamination.

3.9 Data Quality

The subsurface soil, surface water, and sediment analytical data are presented in tabular form in Appendix E. The field samples were collected, documented, handled, analyzed, and reported in a manner consistent with the SI work plan; the FTMC SAP and QAP; and standard, accepted methods and procedures. Sample collection logs pertaining to the collection of these samples were reviewed and organized for this report and are included in Appendix A. As discussed in Section 3.8, one variance to the SFSP was recorded during completion of the SI. However, the variance did not impact the usability of the data.

Data Validation. A complete (100 percent) Level III data validation effort was performed on the reported subsurface soil, surface water, and sediment analytical data. The TPH-DRO soil screening sample data were not validated. Appendix F consists of a data validation summary report that was prepared to discuss the results of the validation. Selected results were rejected or otherwise qualified based on the implementation of accepted data validation procedures and practices. These qualified parameters are highlighted in the report. The validation-assigned qualifiers were added to the FTMC IT Environmental Management System™ database for tracking and reporting. The data presented in this report, except where qualified, meet the principle data quality objective for this SI.

4.0 Site Characterization

Subsurface investigations performed at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), provided soil data used to characterize the geology of the site. Because no wells were installed at Parcel 122(7), a hydrogeological characterization was not performed.

4.1 Regional and Site Geology

4.1.1 Regional Geology

Calhoun County includes parts of two physiographic provinces, the Piedmont Upland Province and the Valley and Ridge Province. The Piedmont Upland Province occupies the extreme eastern and southeastern portions of the county and is characterized by metamorphosed sedimentary rocks. The generally accepted range in age of these metamorphics is Cambrian to Devonian.

The majority of Calhoun County, including the Main Post of FTMC, lies within the Appalachian fold-and-thrust structural belt (Valley and Ridge Province) where southeastward-dipping thrust faults with associated minor folding are the predominant structural features. The fold-and-thrust belt consists of Paleozoic sedimentary rocks that have been asymmetrically folded and thrust-faulted, with major structures and faults striking in a northeast-southwest direction.

Northwestward transport of the Paleozoic rock sequence along the thrust faults has resulted in the imbricate stacking of large slabs of rock referred to as thrust sheets. Within an individual thrust sheet, smaller faults may splay off the larger thrust fault, resulting in imbricate stacking of rock units within an individual thrust sheet (Osborne and Szabo, 1984). Geologic contacts in this region generally strike parallel to the faults, and repetition of lithologic units is common in vertical sequences. Geologic formations within the Valley and Ridge Province portion of Calhoun County have been mapped by Warman and Causey (1962), Osborne and Szabo (1984), and Moser and DeJarnette (1992), and vary in age from Lower Cambrian to Pennsylvanian.

The basal unit of the sedimentary sequence in Calhoun County is the Cambrian Chilhowee Group. The Chilhowee Group consists of the Cochran, Nichols, Wilson Ridge, and Weisner Formations (Osborne and Szabo, 1984) but in Calhoun County is either undifferentiated or divided into the Cochran and Nichols Formations and an upper undifferentiated Wilson Ridge and Weisner Formation. The Cochran is composed of poorly sorted arkosic sandstone and conglomerate with interbeds of greenish-gray siltstone and mudstone. Massive to laminated, greenish-gray and black mudstone makes up the Nichols Formation, with thin interbeds of

siltstone and very fine-grained sandstone (Szabo et al., 1988). These two formations are mapped only in the eastern part of the county.

The Wilson Ridge and Weisner Formations are undifferentiated in Calhoun County and consist of both coarse-grained and fine-grained clastics. The coarse-grained facies appears to dominate the unit and consists primarily of coarse-grained, vitreous quartzite, and friable, fine- to coarse-grained, orthoquartzitic sandstone, both of which locally contain conglomerate. The fine-grained facies consists of sandy and micaceous shale and silty, micaceous mudstone which are locally interbedded with the coarse clastic rocks. The abundance of orthoquartzitic sandstone and quartzite suggests that most of the Chilhowee Group bedrock in the vicinity of FTMC belongs to the Weisner Formation (Osborne and Szabo, 1984).

The Cambrian Shady Dolomite overlies the Weisner Formation northeast, east, and southwest of the Main Post and consists of interlayered bluish-gray or pale yellowish-gray sandy dolomitic limestone and siliceous dolomite with coarsely crystalline porous chert (Osborne et al., 1989). A variegated shale and clayey silt have been included within the lower part of the Shady Dolomite (Cloud, 1966). Material similar to this lower shale unit was noted in core holes drilled by the Alabama Geologic Survey on FTMC (Osborne and Szabo, 1984). The character of the Shady Dolomite in the FTMC vicinity and the true assignment of the shale at this stratigraphic interval are still uncertain (Osborne, 1999).

The Rome Formation overlies the Shady Dolomite and locally occurs to the northwest and southwest of the Main Post as mapped by Warman and Causey (1962) and Osborne and Szabo (1984). The Rome Formation consists of variegated, thinly interbedded grayish-red-purple mudstone, shale, siltstone, and greenish-red and light gray sandstone, with locally occurring limestone and dolomite. The Conasauga Formation overlies the Rome Formation and occurs along anticlinal axes in the northeastern portion of Pelham Range (Warman and Causey, 1962), (Osborne and Szabo, 1984) and the northern portion of the Main Post (Osborne et al., 1997). The Conasauga Formation is composed of dark-gray, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (Osborne et al., 1989).

Overlying the Conasauga Formation is the Knox Group, which is composed of the Copper Ridge and Chepultepec dolomites of Cambro-Ordovician age. The Knox Group is undifferentiated in Calhoun County and consists of light medium gray, fine to medium crystalline, variably bedded to laminated, siliceous dolomite and dolomitic limestone that weather to a chert residuum

(Osborne and Szabo, 1984). The Knox Group underlies a large portion of the Pelham Range area.

The Ordovician Newala and Little Oak Limestones overlie the Knox Group. The Newala Limestone consists of light to dark gray, micritic, thick-bedded limestone with minor dolomite. The Little Oak Limestone is comprised of dark gray, medium- to thick-bedded, fossiliferous, argillaceous to silty limestone with chert nodules. These limestone units are mapped together as undifferentiated at FTMC and other parts of Calhoun County. The Athens Shale overlies the Ordovician limestone units. The Athens Shale consists of dark-gray to black shale and graptolitic shale with localized interbedded dark gray limestone (Osborne et al., 1989). These units occur within an eroded "window" in the uppermost structural thrust sheet at FTMC and underlie much of the developed area of the Main Post.

Other Ordovician-aged bedrock units mapped in Calhoun County include the Greensport Formation, Colvin Mountain Sandstone, and Sequatchie Formation. These units consist of various siltstones, sandstones, shales, dolomites, and limestones, and are mapped as one, undifferentiated unit in some areas of Calhoun County. The only Silurian-age sedimentary formation mapped in Calhoun County is the Red Mountain Formation. This unit consists of interbedded red sandstone, siltstone, and shale with greenish-gray to red silty and sandy limestone.

The Devonian Frog Mountain Sandstone consists of sandstone and quartzitic sandstone with shale interbeds, dolomudstone, and glauconitic limestone (Szabo et al., 1988). This unit locally occurs in the western portion of Pelham Range.

The Mississippian Fort Payne Chert and the Maury Formation overlie the Frog Mountain Sandstone and are composed of dark- to light-gray limestone with abundant chert nodules and greenish-gray to grayish-red phosphatic shale, with increasing amounts of calcareous chert toward the upper portion of the formation (Osborne and Szabo, 1984). These units occur in the northwestern portion of Pelham Range. Overlying the Fort Payne Chert is the Floyd Shale, also of Mississippian age, which consists of thin-bedded, fissile brown to black shale with thin intercalated limestone layers and interbedded sandstone. Osborne and Szabo (1984) reassigned the Floyd Shale, which was mapped by Warman and Causey (1962) on the Main Post of FTMC, to the Ordovician Athens Shale on the basis of fossil data.

The Jacksonville Thrust Fault is the most significant structural geologic feature in the vicinity of FTMC, both for its role in determining the stratigraphic relationships in the area and for its contribution to regional water supplies. The trace of the fault extends northeastward for approximately 39 miles between Bynum, Alabama and Piedmont, Alabama. The fault is interpreted as a major splay of the Pell City Fault (Osborne and Szabo, 1984). The Ordovician sequence that makes up the Eden thrust sheet is exposed at FTMC through an eroded "window," or "fenster," in the overlying thrust sheet. Rocks within the window display complex folding with the folds being overturned and tight to isoclinal. The carbonates and shales locally exhibit well-developed cleavage (Osborne and Szabo, 1984). The FTMC window is framed on the northwest by the Rome Formation, north by the Conasauga Formation, northeast, east, and southwest by the Shady Dolomite, and southeast and southwest by the Chilhowee Group (Osborne et al., 1997).

4.1.2 Site Geology

The soil mapped at Parcel 122(7) is the Anniston and Allen gravelly clay loam. The Anniston and Allen gravelly clay loam is typically reddish brown and is derived from shale or limestone bedrock. This soil has slow infiltration and poor moisture capacity, which makes it very susceptible to erosion (U.S. Department of Agriculture, 1961).

Bedrock beneath Parcel 122(7) is mapped as the undifferentiated Ordovician Little Oak and Newala Limestones (Osborne et al., 1997). The Newala Limestone consists of light to dark gray, micritic, thick-bedded limestone with minor dolomite. The Little Oak Limestone consists of dark gray, medium- to thick-bedded, fossiliferous, argillaceous to silty limestone with chert nodules (Osborne et al., 1989).

Based on direct-push soil boring data collected during the SI, soils at the site consist of a reddish-brown, silty clay from the ground surface to approximately 3 to 4.5 feet bgs. This soil was underlain by a reddish-brown gravelly clay to the bottom of each boring at 6 to 8 feet bgs. The soil descriptions from the direct-push borings confirm that Anniston and Allen gravelly clay loam primarily underlies the site. Bedrock was not encountered during direct-push activities at Parcel 122(7). Appendix C contains the boring logs.

4.2 Site Hydrology

Precipitation in the form of rainfall averages about 54 inches annually in Anniston, Alabama, with infiltration rates annually exceeding evapotranspiration rates (National Oceanic and Atmospheric Administration, 1998). The major surface water features on the Main Post of

FTMC include Remount Creek, Cane Creek, and Cave Creek. These waterways flow in a general northwest to westerly direction towards the Coosa River on the western boundary of Calhoun County.

Parcel 122(7) slopes to the southeast toward a tributary to Remount Creek and ranges in elevation from approximately 805 to 835 feet above mean sea level. Surface runoff follows topography and flows south-southeast toward the tributary to Remount Creek located in the southern portion of the parcel (Figure 3-1).

5.0 Summary of Analytical Results

The results of TPH-DRO surface soil screening and SVOC analysis of samples collected at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), indicate that TPH-DRO were present in surface soils. However, SVOCs were not detected in subsurface soil, surface water, and sediment samples collected at the site. TPH-DRO surface soil screening results are presented in Appendix B, and all other analytical results are presented in Appendix E.

5.1 Surface Soil Screening Results

Sixty-three surface soil-screening samples were collected for TPH-DRO analysis at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7). Surface soil screening samples were collected from the upper 0.5 foot of soil at the locations shown on Figure 3-1. The screening results are presented in Table 5-1 and shown on Figure 5-1.

TPH-DRO concentrations in the surface soil screening samples ranged from less than 11 milligrams per kilogram (mg/kg) to 100 mg/kg (Table 5-1). The highest concentrations of TPH-DRO were at PPMP-122-SS11 and PPMP-122-SS38 (Figure 5-1). Based on the TPH-DRO screening results, subsurface soil sample PPMP-122-GP02 was relocated to surface soil screening location PPMP-122-SS11, and subsurface soil sample PPMP-122-GP03 was relocated to surface soil screening location PPMP-122-SS30. The results of the SVOC analysis of the subsurface soil samples collected are presented in Section 5.2

5.2 Subsurface Soil Analytical Results

Four subsurface soil samples were collected for SVOC analysis at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7). Subsurface soil samples were collected at depths greater than 1 foot bgs at the locations shown on Figure 3-1.

Semivolatile Organic Compounds. SVOCs were not detected in the subsurface soil samples collected at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7).

5.3 Surface Water Analytical Results

One surface water sample was collected at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7). The surface water sample location is shown on Figure 3-1.

Semivolatile Organic Compounds. SVOCs were not detected in the surface water sample collected at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7).

Table 5-1

TPH-DRO Surface Soil Screening Results
Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Number	Sample Date	Sample Depth (Feet bgs)	Result (mg/kg)	Data Qualifier	Reporting Limit (mg/kg)
PPMP-122-SS01	KY0007	2/2/1999	0.0-0.5	15	J, NV	12
PPMP-122-SS02	KY0008	2/2/1999	0.0-0.5	14	J, NV	12
PPMP-122-SS03	KY0009	2/2/1999	0.0-0.5	36	J, NV	12
PPMP-122-SS04	KY0010	2/2/1999	0.0-0.5	26	J, NV	12
PPMP-122-SS05	KY0011	2/2/1999	0.0-0.5	33	J, NV	12
PPMP-122-SS06	KY0012	2/2/1999	0.0-0.5	28	J, NV	13
PPMP-122-SS07	KY0013	2/2/1999	0.0-0.5	45	J, NV	12
PPMP-122-SS08	KY0014	2/2/1999	0.0-0.5	27	J, NV	13
PPMP-122-SS09	KY0015	2/2/1999	0.0-0.5	15	J, NV	12
PPMP-122-SS10	KY0016	2/2/1999	0.0-0.5	27	J, NV	12
PPMP-122-SS11	KY0017	2/2/1999	0.0-0.5	76	J, NV	12
PPMP-122-SS12	KY0018	2/3/1999	0.0-0.5	14	J, NV	12
PPMP-122-SS13	KY0019	2/3/1999	0.0-0.5	19	J, NV	12
PPMP-122-SS14	KY0020	2/3/1999	0.0-0.5	ND	J, NV	12
PPMP-122-SS15	KY0021	2/3/1999	0.0-0.5	21	J, NV	12
PPMP-122-SS16	KY0022	2/3/1999	0.0-0.5	29	J, NV	12
PPMP-122-SS17	KY0023	2/4/1999	0.0-0.5	25	J, NV	13
PPMP-122-SS18	KY0024	2/4/1999	0.0-0.5	22	J, NV	12
PPMP-122-SS19	KY0025	2/2/1999	0.0-0.5	27	J, NV	11
PPMP-122-SS20	KY0026	2/2/1999	0.0-0.5	33	J, NV	13
PPMP-122-SS21	KY0027	2/3/1999	0.0-0.5	21	J, NV	12
PPMP-122-SS22	KY0028	2/3/1999	0.0-0.5	23	J, NV	12
PPMP-122-SS23	KY0029	2/3/1999	0.0-0.5	18	J, NV	12
PPMP-122-SS24	KY0030	2/3/1999	0.0-0.5	17	J, NV	12
PPMP-122-SS25	KY0031	2/3/1999	0.0-0.5	15	J, NV	12
PPMP-122-SS26	KY0032	2/4/1999	0.0-0.5	21	J, NV	12
PPMP-122-SS27	KY0033	2/4/1999	0.0-0.5	17	J, NV	12
PPMP-122-SS28	KY0034	2/2/1999	0.0-0.5	ND	J, NV	11
PPMP-122-SS29	KY0035	2/2/1999	0.0-0.5	52	J, NV	13
PPMP-122-SS30	KY0036	2/3/1999	0.0-0.5	56	J, NV	13
PPMP-122-SS31	KY0037	2/3/1999	0.0-0.5	13	J, NV	12
PPMP-122-SS32	KY0038	2/3/1999	0.0-0.5	ND	J, NV	12
PPMP-122-SS33	KY0039	2/3/1999	0.0-0.5	ND	J, NV	12
PPMP-122-SS34	KY0040	2/3/1999	0.0-0.5	21	J, NV	12
PPMP-122-SS35	KY0041	2/4/1999	0.0-0.5	17	J, NV	12
PPMP-122-SS36	KY0042	2/4/1999	0.0-0.5	15	J, NV	12
PPMP-122-SS37	KY0043	2/2/1999	0.0-0.5	21	J, NV	12
PPMP-122-SS38	KY0044	2/2/1999	0.0-0.5	100	J, NV	14
PPMP-122-SS39	KY0045	2/3/1999	0.0-0.5	38	J, NV	13
PPMP-122-SS40	KY0046	2/3/1999	0.0-0.5	57	J, NV	13
PPMP-122-SS41	KY0047	2/3/1999	0.0-0.5	17	J, NV	12
PPMP-122-SS42	KY0048	2/3/1999	0.0-0.5	24	J, NV	13
PPMP-122-SS43	KY0049	2/3/1999	0.0-0.5	ND	J, NV	12
PPMP-122-SS44	KY0050	2/4/1999	0.0-0.5	12	J, NV	12
PPMP-122-SS45	KY0051	2/4/1999	0.0-0.5	23	J, NV	13

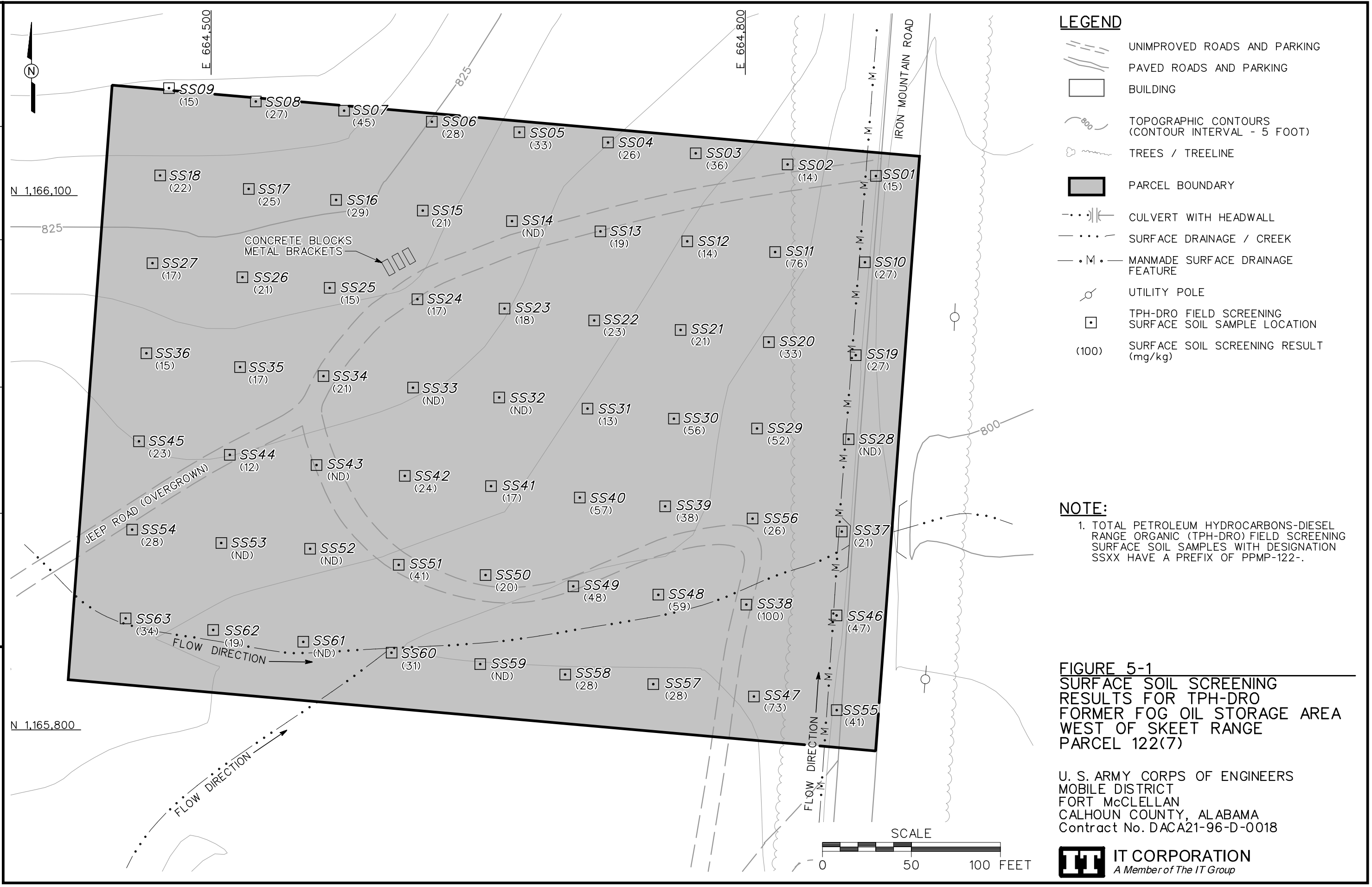
Table 5-1

TPH-DRO Surface Soil Screening Results
Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Number	Sample Date	Sample Depth (Feet bgs)	Result (mg/kg)	Data Qualifier	Reporting Limit (mg/kg)
PPMP-122-SS46	KY0052	2/2/1999	0.0-0.5	47	J, NV	23
PPMP-122-SS47	KY0053	2/2/1999	0.0-0.5	73	J, NV	14
PPMP-122-SS48	KY0054	2/3/1999	0.0-0.5	59	J, NV	13
PPMP-122-SS49	KY0055	2/3/1999	0.0-0.5	48	J, NV	13
PPMP-122-SS50	KY0056	2/3/1999	0.0-0.5	20	J, NV	13
PPMP-122-SS51	KY0057	2/3/1999	0.0-0.5	41	J, NV	13
PPMP-122-SS52	KY0058	2/3/1999	0.0-0.5	ND	J, NV	13
PPMP-122-SS53	KY0059	2/4/1999	0.0-0.5	ND	J, NV	13
PPMP-122-SS54	KY0060	2/4/1999	0.0-0.5	28	J, NV	13
PPMP-122-SS55	KY0061	2/2/1999	0.0-0.5	41	J, NV	11
PPMP-122-SS56	KY0062	2/3/1999	0.0-0.5	26	J, NV	13
PPMP-122-SS57	KY0063	2/3/1999	0.0-0.5	28	J, NV	13
PPMP-122-SS58	KY0064	2/3/1999	0.0-0.5	28	J, NV	14
PPMP-122-SS59	KY0065	2/3/1999	0.0-0.5	ND	J, NV	13
PPMP-122-SS60	KY0066	2/3/1999	0.0-0.5	31	J, NV	14
PPMP-122-SS61	KY0067	2/3/1999	0.0-0.5	ND	J, NV	13
PPMP-122-SS62	KY0068	2/4/1999	0.0-0.5	19	J, NV	13
PPMP-122-SS63	KY0069	2/4/1999	0.0-0.5	34	J, NV	14

Analyses performed by Quanterra Environmental Services using a screening-level version of EPA Method 8015B for TPH-DRO.

bgs - below ground surface
mg/kg - milligrams per kilogram
ND - not detected
J - estimated concentration
NV - not validated
TPH-DRO - Total petroleum hydrocarbons-diesel range organics.



LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- MANMADE SURFACE DRAINAGE FEATURE
- UTILITY POLE
- TPH-DRO FIELD SCREENING SURFACE SOIL SAMPLE LOCATION
- (100) SURFACE SOIL SCREENING RESULT (mg/kg)

NOTE:

1. TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE ORGANIC (TPH-DRO) FIELD SCREENING SURFACE SOIL SAMPLES WITH DESIGNATION SSXX HAVE A PREFIX OF PPMP-122-.

FIGURE 5-1
SURFACE SOIL SCREENING RESULTS FOR TPH-DRO FORMER FOG OIL STORAGE AREA WEST OF SKEET RANGE PARCEL 122(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

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ENGR. CHCK. BY: S. MORAN
PROJ. MGR.: J. YACOUB
INITIATOR: J. REMO
DATE LAST REV.:
DRAWN BY:
STARTING DATE: 09/28/00
DRAWN BY: D. BILLINGSLEY
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5.4 Sediment Analytical Results

One sediment sample was collected at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7). The sample was collected from the upper 0.5 foot of sediment at the sample location shown on Figure 3-1.

Semivolatile Organic Compounds. SVOCs were not detected in the sediment sample collected at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7).

Total Organic Carbon. The total organic carbon concentration in the sediment sample was 11,800 mg/kg, as summarized in Appendix E.

Grain Size. The results of grain size analysis for the sediment sample are included in Appendix E.

6.0 Summary and Conclusions and Recommendations

IT, under contract to USACE, completed an SI at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), at FTMC in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at site, and, if present, whether the concentrations present an unacceptable risk to human health or the environment. The SI at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), consisted of the sampling and analysis of 63 surface soil screening samples, 4 subsurface soil samples, 1 surface water sample, and 1 sediment sample. Four direct-push soil borings installed at the site provided site-specific geological characterization information.

The surface soils screening for hydrocarbons at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), indicated that TPH-DRO were present in surface soils. TPH-DRO concentrations ranged from less than 11 mg/kg to 100 mg/kg. However, the TPH-DRO data were collected for screening purposes only; therefore, instrument calibration requirements for the method were waived. Consequently, the quantitative results of this screening level TPH-DRO analysis should be considered estimated.

Chemical analysis of the four subsurface soil samples (including two subsurface soil samples that were relocated to locations with elevated surface soil screening results), one surface water sample, and one sediment sample was limited to SVOCs only. SVOCs were not detected in any of the subsurface soil, surface water, or sediment samples collected at the site. In the future land-use scenario, portions of Parcel 122(7) will be reused for retail, passive recreation, and for the Eastern Bypass (FTMC, 1997). Under these land-use scenarios, the concentrations of TPH-DRO in surface soils are not expected to pose a significant threat to human health or ecological receptors.

Based on the results of the SI, past operations at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7), do not appear to have adversely impacted the environment. The low levels of TPH-DRO detected in surface soils at the site do not pose an unacceptable risk to human health and the environment. Therefore, IT recommends “No Further Action” and unrestricted land reuse with regard to hazardous, toxic, and radioactive waste at the Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7).

7.0 References

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ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS

APPENDIX A

SAMPLE COLLECTION LOGS AND ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS

SAMPLE COLLECTION LOGS

ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS

APPENDIX B

SURFACE SOIL SCREENING RESULTS

APPENDIX C

BORING LOGS

BORING LOGS

APPENDIX D

SURVEY DATA

Appendix D

Survey Data
Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft msl)	Top of Casing Elevation (ft msl)
PPMP-122-GP01	1166160.98	664457.28	835.24	NA
PPMP-122-GP02	1166066.27	664821.18	807.91	NA
PPMP-122-GP03	1165972.97	664777.38	807.42	NA
PPMP-122-GP04	1165871.97	664799.36	806.21	NA
PPMP-122-SS01	1166110.23	664874.14	804.85	NA
PPMP-122-SS02	1166116.67	664824.56	812.05	NA
PPMP-122-SS03	1166122.97	664772.96	814.38	NA
PPMP-122-SS04	1166129.03	664723.72	815.89	NA
PPMP-122-SS05	1166134.73	664673.95	822.33	NA
PPMP-122-SS06	1166140.72	664624.78	828.48	NA
PPMP-122-SS07	1166146.89	664575.47	833.00	NA
PPMP-122-SS08	1166152.06	664525.91	833.32	NA
PPMP-122-SS09	1166159.52	664477.16	834.98	NA
PPMP-122-SS10	1166061.73	664867.94	803.46	NA
PPMP-122-SS11	1166067.54	664817.51	808.92	NA
PPMP-122-SS12	1166073.49	664768.20	811.15	NA
PPMP-122-SS13	1166079.09	664719.44	814.31	NA
PPMP-122-SS14	1166084.87	664669.76	818.03	NA
PPMP-122-SS15	1166090.74	664619.67	822.98	NA
PPMP-122-SS16	1166096.74	664571.01	827.54	NA
PPMP-122-SS17	1166102.93	664521.95	828.22	NA
PPMP-122-SS18	1166110.49	664472.19	828.41	NA
PPMP-122-SS19	1166009.59	664862.78	803.28	NA
PPMP-122-SS20	1166016.90	664813.99	806.70	NA
PPMP-122-SS21	1166023.77	664764.42	810.08	NA
PPMP-122-SS22	1166029.08	664715.92	811.26	NA
PPMP-122-SS23	1166035.78	664665.62	816.44	NA
PPMP-122-SS24	1166041.01	664616.65	820.52	NA
PPMP-122-SS25	1166047.39	664567.42	822.17	NA
PPMP-122-SS26	1166053.34	664518.43	823.62	NA
PPMP-122-SS27	1166061.29	664467.90	824.19	NA
PPMP-122-SS28	1165962.43	664858.76	803.17	NA
PPMP-122-SS29	1165968.38	664807.36	805.62	NA
PPMP-122-SS30	1165973.95	664760.71	807.48	NA
PPMP-122-SS31	1165979.58	664712.17	812.43	NA
PPMP-122-SS32	1165985.85	664662.56	814.00	NA
PPMP-122-SS33	1165991.38	664614.21	817.50	NA
PPMP-122-SS34	1165997.80	664563.92	819.49	NA
PPMP-122-SS35	1166002.91	664517.08	820.36	NA
PPMP-122-SS36	1166010.68	664464.49	820.01	NA
PPMP-122-SS37	1165910.60	664854.95	801.96	NA
PPMP-122-SS38	1165869.57	664801.33	806.34	NA
PPMP-122-SS39	1165924.75	664755.80	806.90	NA

Appendix D

Survey Data
Former Fog Oil Storage Area West of the Skeet Range, Parcel 122(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft msl)	Top of Casing Elevation (ft msl)
PPMP-122-SS40	1165929.64	664707.87	809.04	NA
PPMP-122-SS41	1165936.05	664657.99	812.70	NA
PPMP-122-SS42	1165941.80	664609.59	816.90	NA
PPMP-122-SS43	1165947.89	664560.01	817.67	NA
PPMP-122-SS44	1165953.67	664511.31	817.25	NA
PPMP-122-SS45	1165961.26	664460.34	819.96	NA
PPMP-122-SS46	1165863.47	664852.05	798.41	NA
PPMP-122-SS47	1165818.00	664805.65	807.45	NA
PPMP-122-SS48	1165875.11	664751.97	807.45	NA
PPMP-122-SS49	1165879.79	664704.22	808.74	NA
PPMP-122-SS50	1165886.12	664654.95	810.45	NA
PPMP-122-SS51	1165891.88	664606.2	811.76	NA
PPMP-122-SS52	1165900.90	664556.38	812.99	NA
PPMP-122-SS53	1165904.15	664506.53	813.78	NA
PPMP-122-SS54	1165911.63	664456.46	819.39	NA
PPMP-122-SS55	1165810.29	664855.73	796.66	NA
PPMP-122-SS56	1165917.86	664804.85	805.88	NA
PPMP-122-SS57	1165824.91	664749.11	807.19	NA
PPMP-122-SS58	1165830.28	664699.64	808.79	NA
PPMP-122-SS59	1165836.17	664651.95	810.06	NA
PPMP-122-SS60	1165842.57	664602.13	811.14	NA
PPMP-122-SS61	1165848.68	664552.60	811.30	NA
PPMP-122-SS62	1165855.32	664501.97	812.34	NA
PPMP-122-SS63	1165861.79	664452.80	814.01	NA
PPMP-122-SW-SD01	1165894.82	664846.70	803.47	NA

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum, 1983.

Elevations referenced to the North American Vertical Datum of 1988.

ft msl - Feet mean sea level
NA - Not applicable, temporary well not installed.

APPENDIX E

SUMMARY OF VALIDATED ANALYTICAL DATA

APPENDIX F

DATA VALIDATION SUMMARY REPORT

APPENDIX G

VARIANCES/NONCONFORMANCES